

Thermal Mapping Airborne Simulator for Small Satellite Sensor, Phase I

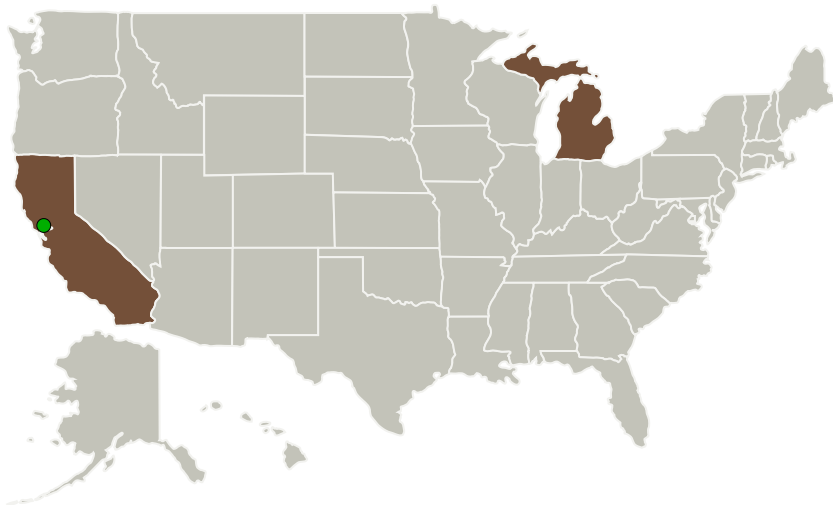
Completed Technology Project (2012 - 2012)



Project Introduction

a high performance, inexpensive, airborne simulator that will serve as the prototype for a small satellite based imaging system capable of mapping thermal anomalies on the surface of the earth with a high revisit rate and high spatial resolution is proposed. The Thermal Mapping Airborne Simulator for Small Satellite Sensor (TMAS) will be developed to a TRL 8 in the Phase II and the space-qualified system will be developed and built in Phase III. The proposed system will deliver high spatial resolution (133 urad), high signal to noise performance, two or three spectral bands, and onboard processing to extract the information of greatest value, orthorectify the imagery, and reduce the size of the data for transmission. This sensor system is designed to fit within the size, weight, and power (SWaP) envelopes of typical remote sensing aircraft and small satellites. For this proposal we have developed a notional design that will be reviewed and further developed during the Phase I. The proposed design incorporates a step stare scanning mirror, a two band (LWIR 8 to 9 um and MWIR 4 – 5 um) Quantum Well Infrared Photodetector (QWIP), a short wave IR sensor (1.6 um), and an FPGA based image processing and orthorectification processing module.

Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
Xiomas Technologies	Lead Organization	Industry	Ypsilanti, Michigan
● Ames Research Center(ARC)	Supporting Organization	NASA Center	Moffett Field, California

Primary U.S. Work Locations	
California	Michigan

Project Transitions

**February 2012:** Project Start**August 2012:** Closed out**Closeout Documentation:**

- Final Summary Chart(<https://techport.nasa.gov/file/137758>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Xiomas Technologies

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

John M Green

Co-Investigator:

John C Green

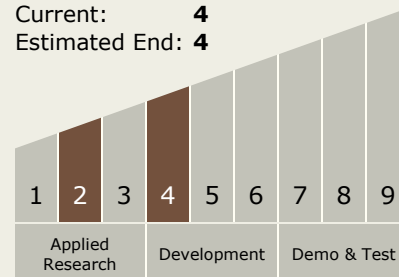
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Technology Maturity (TRL)

Start: 2
Current: 4
Estimated End: 4



Technology Areas

Primary:

- TX12 Materials, Structures, Mechanical Systems, and Manufacturing
 - └ TX12.3 Mechanical Systems
 - └ TX12.3.4 Reliability, Life Assessment, and Health Monitoring

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System